CALIFORNIA RESOURCES AGENCY
COASTAL IMPACT ASSISTANCE PROGRAM
PROJECT PROPOSAL FORM

Department:	**California Coastal Commission, Monterey Bay National Marine Sanctuary (MBNMS)**
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Title of project:	**Revised Oil Wildlife Sensitivity Maps for Monterey Bay National Marine Sanctuary**
Project location:	**Central California coast, from Marin to Cambria**
Total cost:	**$154,000**
Funding request:	**$75,000**

MISSION

To ensure comprehensive and coordinated management, conservation and enhancement of California's ocean and coastal resources for their intrinsic value and for the benefit of current and future generations.

GOALS: Four goals have been established by the State of California to achieve this mission.

Goal 1: Stewardship. To assess, conserve, and manage California's ocean and coastal resources and the ecosystem that supports those resources.

Goal 2: Economic Sustainability. To encourage environmentally sound, sustainable, and economically beneficial ocean and coastal resource development activities.

Goal 3: Research, Education and Technology. To advance research, educational programs, and technology developments to meet future needs and uses of coastal and ocean resources.

Goal 4: Jurisdiction and Ownership. To maximize California's interests in coastal watersheds, State Tidelands, the Territorial Sea, and the Exclusive Economic Zone.

Project Summary:

Synopsis

Reliable Environmental Sensitivity Indexes (ESI) of the abundances and distributions of resources and habitats are critical for effective management and conservation of coastal zones, especially protected areas such as the Monterey Bay National Marine Sanctuary (MBNMS). From data collected in 1992, the California Department of Fish and Game (CDFG), Office of Spill Preventions and Response (OSPR), published a series of ESI documents containing detailed maps of marine resources that are sensitive to oil spills for the entire California coastline. Although developed mainly for spill response, these maps have become invaluable tools for the management of California coastal environments, including the Sanctuary. However, given the dynamic nature of shorelines and biological communities, many aspects of the original maps produced nearly 10 years ago have now become outdated or unreliable. If funded, this grant would be matched with existing MBNMS funds to update and expand the current ESI database within the Sanctuary boundaries.

Background

A comprehensive understanding of habitat locations and species distributions is a fundamental element of resource management and protection. In particular, complete, reliable and accessible resource maps are critical to safeguard vulnerable communities and habitats from threats and to respond effectively to disturbances. The best example of this for California coastal environments are the ESI databases and maps (Sensitivity of Coastal Environments and Wildlife to Spilled Oil) produced by California Department of Fish and Game's OSPR program for response to oil spills. These habitat sensitivity documents identify California shoreline habitat types in 14 categories (e.g., exposed rocky cliff, gravel beach, marsh) and their associated wave and tidal energy, biological productivity and sensitivity, and ease of oil spill cleanup. The databases and maps also distinguish sensitive biological resources (birds, mammals, fish, invertebrates and plants), critical areas (including seabird nesting colonies, anadromous fish runs, marine fish spawning grounds and nursery areas, migratory whale concentration areas and calving grounds, and seal and sea lion pupping and haul-out sites), and 18 separate human-use features (e.g., aquaculture operations, archaeological and historic sites, recreational beaches). If an oil spill occurs along the California coast, this information is essential for determining potential impacts and for designing appropriate containment, cleanup and recovery measures.

The guidelines for use of Coastal Impact Assistance Program (CIAP) funds state that up to 23% will be dedicated to "public service needs intended to mitigate the environmental effects of Outer Continental Shelf (OCS) activities". The most critical portions of the MBNMS that could be affected by oil are the southern half of the Sanctuary including the Big Sur coast. The Minerals Management Service's own environmental analyses show that blowouts, pipeline failures and marine tanker spills from OCS activities offshore Santa Barbara County could easily affect central California. Moreover, expanded development offshore of Santa Barbara County as well as in Alaska will certainly mean more oil tanker shipments off coastal California, greatly increasing the chance of impact from spilled oil. Comprehensive, up-to-date ESI data and maps are therefore of particular importance for the Sanctuary.

The value of these databases, however, goes far beyond providing the ability to respond effectively to oil spills. The MBNMS, on a nearly day-to-day basis, utilizes the existing ESI information in several ways. For example, the Sanctuary uses the existing habitat sensitivity maps in responses to other coastal accidents, such as grounded ships and untreated sewage release. Furthermore, both the MBNMS and the California Coastal Commission (CCC) often consider the information found in the existing ESI databases for their permitting process of coastal activities including shoreline development projects, low flying aircrafts, and CalTrans road slide disposal.

Statement of Problem

Although extremely valuable, the existing ESI database and maps have a major limitation; several components are outdated and incomplete. Data for the original maps was collected in 1992 and published in 1994. Since then, a large portion of the shoreline has been modified due to factors such as erosion and coastal development. Biological communities are also very dynamic and many have changed considerably since 1992. For example, in the past few years a large population of Elephant seals has begun utilizing beaches at Piedras Blancas as a haul out and pupping site (much further south than previously recorded).

Furthermore, the current ESI data for California extends offshore only as far as the outer edge of the U.S. Geological Survey (USGS) quadrangles used during original data collection and atlas production. Therefore, important resources reaching from nearshore waters beyond the USGS plots are not fully represented in the existing ESI documents. The current trend in environmental and habitat sensitivity data development, especially during update periods, is to extend the ESI study area to at least the offshore extent of state waters, and where National Marine Sanctuaries are involved (Florida, Georgia, Massachusetts, and Hawaii to date), offshore study areas have encompassed at least the full offshore extent of the sanctuaries.

Proposed Project

Objective 1

Update and expand both in detail and geographically (i.e., offshore) the Shoreline Habitats, Sensitive Biological Resources, and Human Use Features in the existing California Department of Fish and Game's ESI database within the boundaries of the Monterey Bay National Marine Sanctuary.

Objective 2

Provide updated and expanded digitized information and maps as hard copies, electronic documents, and GIS (Geographic Information System) layers that can be distributed via the Internet for use by the Monterey Bay National Marine Sanctuary, California Coastal Commission, California Department of Fish and Game, other agencies and organizations, and the general public.

Methods

Shoreline classification - Because some regions of the MBNMS are fairly stable through time (e.g., granite shores of the Monterey Peninsula), while other regions are very dynamic (e.g., Big Sur landslides), the first major step in the process of updating the existing ESI database

and maps is to revise coastline positions and classifications. Most revisions will be done by photo-interpretation using current USGS digital ortho quarterquads (DOQs) and aerial infrared images of the central California coastline collected by the MBNMS in August 2000. This information will be compared with the existing ESI classification using Arc/Info software. Original digital representations of coastline position will be used for areas identified as unchanged, whereas the position of areas identified as having changed significantly will be re-digitized and mapped. Through this process, areas that will require field verification of shoreline classification will also be flagged. Overflights (at low altitude and slow air speed) and site visits for precise measurements and ground truthing (e.g., biological community types, quantitative beach profiles) will be utilized to draft final revisions on position and classification to a set of working maps.

Biological and human-use resources - The second step for updating and expanding the ESI database and maps is to evaluate the biological and human-use resources. Species, communities, habitats and human-use resources that are know to have changed, or merit addition to the ESI database, will be prioritized to identify areas of greatest need of revision. Regional scientists and managers with expertise in all components of the ESI database will then be found to help identify other resource requiring modification or addition to the existing database, and to provide the up to date information. Starting with the high priority areas, the experts will be asked to review specific locations or resources of the current ESI to: (1) identify the specific data that require revision and/or expansion, (2) edit or add information to copies of the existing maps, and (3) fill out standardized data forms with relevant information (e.g., species name, common name, population size, life history parameters, federal and/or state listed status, etc.). For example, investigators with the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) are currently surveying and studying rockyshore intertidal and subtidal communities throughout California and Oregon to in part provide information to the MBNMS for resource management and conservation. PISCO can therefore provide valuable, detailed and comprehensive data on the current locations and species composition of algae, invertebrates and fish communities along the Sanctuary's rockyshores. As part of this exercise, contact information for all appropriate experts, agencies and organizations included in part of the original ESI documents will also be updated and expanded.

In addition to expert surveys, specific data sets that can provide the information needed to update and expand the ESI database and maps will also be located through the Sanctuary Integrated Monitoring Network (SIMoN). Summaries of all available data on resources throughout the MBNMS were compiled as a first step in the development of SIMoN and are a convenient tool for identifying and locating existing information.

Similar to the update of shoreline classifications, some fieldwork will be required to better characterize biological and human-use resources in areas where little is currently known. This is particularly true for offshore locations and the remote coastline of Big Sur. This work will be linked closely to the efforts of the Marine Resource Surveys Related to CalTrans/Hwy 1 program also proposed by MBNMS and CCC. Therefore, shoreline classification data and direct surveys of the abundance and distribution of various biological resources (such as bird nesting sites and intertidal shellfish) by foot, air, boat or divers will be coordinated so efforts are not duplicated and so all data can be shared across program.

Products and Collaborations

All biological and human-use resource data edits and additions will be incorporated into the updated digitized shoreline positions and classifications to produce a comprehensive MBNMS database and a series of maps. A new ESI document containing all the information will then be produced in three formats; (1) full sized hard copies, (2) electronic versions on CD-ROM, and (3) as digital GIS data layers accessible through Arc/View and related software applications.

The primary method for distribution of the new ESI database and maps to management agencies for decision-making, to regional researchers as basic characterization data, and the general public as an educational tool on sensitive resources and habitats, will be via the Internet. The distribution of the updated and expanded ESI database and maps will be coordinated through the SIMoN effort. This MBNMS sponsored program is being initiated as a hub for integrating, synthesizing and disseminating monitoring information through various approaches including a web portal based on a GIS map of the Sanctuary with links to research and monitoring data summaries and full data sets. The electronic ESI database for the MBNMS will provide valuable basic GIS layers of habitats classifications and resources for the SIMoN program and will be directly linked to, and integrated with, larger data sets that provide extended information on various locations, species, communities and processes.

This proposed work to update and expand the current ESI will be conducted in collaboration with the California Department of Fish and Game and the California Coastal Commission. In particular, we will work directly with John Tarpley (ES IV, Supervisor, CDFG) to assure that our Sanctuary ESI database and products are built directly upon the current OSPR habitat sensitivity documents he helped design. It is also our aim to utilize this proposed effort as the first step in a three-phased approach (southern, central and northern California) by OSPR to update all coastal ESI databases and maps. Although CDFG has yet to allocate funds for ESI updates, this effort can be viewed as matching support for one third (central California) of this important statewide endeavor.

Lastly, it is important to point out that the MBNMS has already secured the funds required to address two specific components of the ESI process. The costs of resurveying and mapping sea and shorebird nesting sites and marine mammal haul out and pupping sites will be covered by Sanctuary matching support ($79,000). These funds will not only update and expand the ESI information on two important biological resources but will also consider changes to the locations and habitats they utilize (i.e., general coastal positions and classifications). The funds requested from CIAP to address other regions and resources of the Sanctuary are therefore reduced significantly.

Consistency with CIAP Mission and Goals:

This project will meet the State's mission by developing strategies to protect California's most valuable natural resource, its coastline, from its various threats including dramatic and pervasive oil spills. Future generations will rely upon today's actions to protect coastal resources from threats, and by knowing the location of critical, sensitive habitats and wildlife, we can better safeguard and manage these critical resources. Therefore, Goal 1 that

mandates proper stewardship of coastal resources is met by this proposed work. Moreover, lacking such protective information, our society may be unwilling to allow development of offshore petroleum reserves, thereby exacerbating current energy crises. Thus, this effort allows Goal 2 to be met by ensuring coastal energy extraction will not place an undue burden on coastal resources. The results of this effort will also provide a valuable basic spatial framework (classifications and maps) for disseminating information through the SIMoN program to the local research community and the general public. It therefore addresses Goal 3 of advancing research and educational development. Lastly, as stated above, this project also meets the goals of the Coastal Impact Assistance Program by identifying a critical mitigation need from development of Outer Continental Shelf resources.

Timeline:

Digital classifications and field surveys	4 months
Literature reviews and expert surveys	4 months
Field surveys to characterize resources	12 months
Analysis, mapping and final products	4 months
Total time	24 months

Budget:

The funds requested will be used to hire contractors to work closely with MBNMS, CDFG and CCC staff to conduct the following components of the proposed work:

Digital classifications and mapping work	$10,000
Literature reviews and expert surveys	$5,000
Field surveys to classify shoreline and characterize resources (excluding bird nesting and marine mammal haul out site)	$37,000
Analysis, mapping and final products	$23,000
Matching funds from the MBNMS (to map sensitive bird and marine mammal habitats)	$79,000
Total project budget	$154,000
Total requested from CIAP funds	$75,000